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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/604,791

08/18/2003

SHIH-CHANG LEE

9249-US-PA

1790

31561

7590

01/11/2005

JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

EXAMINER

NGUYEN, CUONG QUANG

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/604,791		LEE ET AL.	
	Examiner		Art Unit	
	Cuong Q. Nguyen		2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-24 is/are pending in the application.
- 4a) Of the above claim(s) 21-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 11-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restriction

1. Applicant's election with traverse of Embodiment I (Fig.2 to Fig.6), claims 1-20 is acknowledged. The traversal is on the ground(s) that three embodiment are not distinct from each other, and they are unable to support separate patents. This is not found persuasive because as shown in Fig.6 to fig.8, top surface of package body (299) in Fig.6 is not covering by packaging material while top surfaces of package bodies (399) and (499) of Fig.7 and Fig.8 are covering by packaging material; and structures of package bodies (299), (399) and (499) are totally different, they are not obvious and they are distinct from each other.

The requirement is still deemed proper and is therefore made FINAL.

It is noted that claims 1-10 have been canceled in amendment filed on 10-11-04, so only claims 11-20 are considered at this time.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 11, 12, 13, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Juskey et al. (US 6,356,453).

Regarding claim 11, Juskey et al. discloses a process for fabricating a multi-chip package module, comprising the steps of: providing a substrate (12); providing a first chip (22); providing a package body having a plurality of bumps (34); attaching the first chip to the substrate; bonding a plurality of conductive wires (28) so that the first chip and the substrate are electrically connected; bonding the package body to the substrate through the bumps; and performing an encapsulation process to form a packaging material (56) that encloses the first chip, the conductive wires, the package body and the substrate. See Juskey et al.'s Fig.1 to Fig.4.

Regarding claim 12, Juskey et al. teaches that the first chip is a functional chip (an active chip) (col.1, lines 10-20).

Regarding claim 13, as shown in Juskey et al.'s Fig.4, the package body has a second chip (32) electrically connected to the bumps.

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Regarding claim 19, as shown in Jusky et al.'s Fig.2 and Fig.3, after the step of attaching the package body to the substrate through the bumps, the first chip is attached onto the substrate, and then the conductive wires are bonded to electrically connect the first chip with the substrate.

Claims 11 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Kikuma et al. (US 6,621,169).

Regarding claim 11, Kikuma et al. discloses a process for fabricating a multi-chip package module, comprising the steps of: providing a substrate (114); providing a first chip (104); providing a package body having a plurality of bumps; attaching the first chip to the substrate; bonding a plurality of conductive wires so that the first chip and the substrate are electrically connected; bonding the package body to the substrate through the bumps; and performing an encapsulation process to form a packaging material (130) that encloses the first chip, the conductive wires, the package body and the substrate. See Kikuma et al.'s Fig.25.

Regarding claim 14, Kikuma teaches that the second chip is a memory chip. Col.9 lines 10-15.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jusky et al.

Jusky et al. teaches all the limitations of claims 11 and 19 as shown above such as the first chip is attached onto the substrate, and then the conductive wires are bonded to electrically connect the first chip with the substrate after the step of attaching the package body to the substrate through the bumps. Jusky et al. does not explicitly teach that a reverse order can be formed such as the first chip is attached onto the substrate, and then the conductive wires are bonded to electrically connect the first chip with the substrate before the step of attaching the package body to the substrate through the bumps.

It would have been obvious to one of ordinary skill in the art to attach first the first chip onto the substrate, and then the conductive wires are bonded to electrically connect the first chip with the substrate after the step of attaching the package body to

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the substrate through the bumps as claimed because absent a showing of unexpected result, a change in sequence involves routine optimization of process of prior art and would have been obvious to one skilled in the art at the time the invention was made. A change in sequence/reversal of process steps is obvious under 35 USC 103 (ex parte Rubin, 128 USPQ 440 (Bd. App. 1959)). See also in re Burhans, 154 F.2d 690, 69 USPQ 330 (CCPA).

Regarding claim 20, Jusky does not explicitly teach that a liquid temperature of the packaging material in the encapsulation process is lower than a melting point of the bumps.

It is conventional and known in the art that a liquid temperature of the packaging material in the encapsulation process is lower than a melting point of the bumps so the bumps cannot be damaged by the heat which is used to form the packaging material. So, it would have been obvious to one of ordinary skill in the art to form the packaging material such that a liquid temperature of the packaging material in the encapsulation process is lower than a melting point of the bumps as claimed.

Claims 17, 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jusky et al. in view of Pu et al. (US 6,610,560).

Regarding claim 17, Jusky et al. teaches all the limitations of claim 11 as shown above. However, Jusky et al. does not teach that a heat sink is attached onto a surface of the packaging material.

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Pu et al. discloses a process for fabricating a multi-chip package module, comprising the steps of: after performing an encapsulation process to form a packaging material (270), a heat sink (290) is attached onto a surface of the packaging material. See Pu et al.'s Fig.2C and Fig.2D.

It would have been obvious to one of ordinary skill in the art to attach a heat sink onto the surface of the packaging material as taught by Pu et al. into Jusky et al. in order to help increase the heat-dissipation efficiency of the multi-chip module. See Pu's col.5 lines 1-5.

Regarding claims 15 and 16, Jusky does not teach that the second chip is partially enclosed by the packaging material.

As shown in Po's Fig.2C and Fig.2D, an upper surface of the packaging material is coplanar to an upper surface of a second chip (230) that the second chip is partially enclosed by the packaging material.

It would have been obvious to one of ordinary skill in the art to form the packaging material coplanar with the second chip so that the second chip is partially enclosed by the packaging material as taught by Po et al. into Jusky et al. in order to reduce the height of the device.

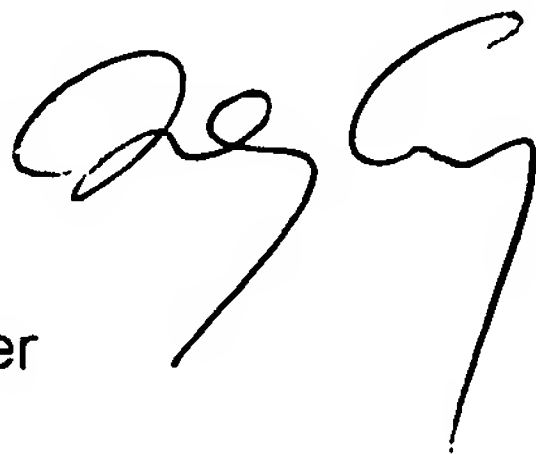
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Conclusion

4. Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 872-9306. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.
5. Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to CUONG Q NGUYEN whose telephone number is (571) 272-1661. The Examiner is in the Office generally between the hours of 6:30 AM to 5:00 PM (Eastern Standard Time) Monday through Thursday.
6. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Eddie Lee who can be reached on (571) 272-1732.
7. Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center Receptionists whose telephone number is 308-0956.

Cuong Nguyen

Primary examiner



1/6/05